CLAIMS

1. A two-dimensional code reading method comprising processing steps of acquiring an image of a matrix type two-dimensional code composed of a number of cells arranged in vertical and horizontal directions to form a matrix of the cells each representing binary coded data, deciding a two-dimensional code area in the image, setting inspection lines identifying a center position of each of the cells, said inspection lines each joining two paired opposites of four sides defining the boundary of the decided two-dimensional code area and reproducing information of the two-dimensional code based on the inspection lines set by the inspection line setting processing, wherein coefficients in image position calculating equations for calculating coordinate positions of center positions of respective cells in the two-dimensional code compensated for image inclination by adding inclination information for the two-dimensional code are calculated for setting the inspection lines on the two-dimensional code image based on coordinate positions of 4 points within the two-dimensional code area decided by the two-dimensional code area deciding step.

2. A two-dimensional code reading method as defined in claim 1, wherein each of the image position calculating equations for determining the coordinate positions of the center positions of the respective cells in the two-dimensional code

42

image is expressed by a recurrence formula with respect to a center position of each of the cells to reduce a volume of calculation for determining the coordinate positions of the center positions of respective cells compensated for image inclination by adding the inclination information of the two-dimensional code.

3. A two-dimensional code reading method as defined in claim 1 or 2, wherein coefficients in the image position calculating equations for calculating coordinate positions at four corners of the two-dimensional code area are divided by a predetermined same constant to make them integers and the coordinate positions of the cell center positions are determined by calculation with the integers only.

4. A two-dimensional code reading method as defined in claim 1 or 2, wherein a constant for dividing the coefficients symbolically determined for the image position calculating equations and selected from constants frequently and commonly used in the image position calculating equations is used to divide and convert the coefficients to smaller in size coefficients to make the two-dimensional code readable.

5. A two-dimensional code reading method comprising processing steps of acquiring an image of a stack type two-dimensional code composed of a number of bar codes arranged in multiple layers in a direction perpendicular to a direction of arrangement of bars in each bar code representing data, deciding a two-dimensional code area in the image; setting an

inspection line identifying a center position of each of the bar codes, said inspection line joining one of two pairs of opposites of four sides representing the boundary of the decided two-dimensional code area, said pair opposite to each other in the direction of arrangement of bars in each bar code; and reproducing information of the two-dimensional code based on the inspection lines set in the inspection line setting step, wherein coefficients in image position calculating equations for calculating coordinate positions of center positions of respective cells in the two-dimensional code compensated for image inclination by adding inclination information for the two-dimensional code are calculated for setting the inspection lines on the two-dimensional code image based on coordinate positions of 4 points within the two-dimensional code area decided by the two-dimensional code area deciding step.

6. A two-dimensional code reading program which describes the two-dimensional code reading method defined in any one of claims 1 to 5 by program codes executable by a computer.

7. A program recording medium which is readable by a computer and holding thereon the two-dimensional code reading program of claim 6.

8. A two-dimensional code reading device comprising an image capturing portion for capturing an image of a matrix type two-dimensional code composed of a number of cells arranged in vertical and horizontal directions to form a matrix of the cells each representing binary coded data, a two-dimensional

code area deciding portion for deciding a two-dimensional code area in the two-dimensional code image, an inspection line setting portion for setting inspection lines identifying a center position of each of the cells, said inspection lines each joining two paired opposites of four sides defining the boundary of the decided two-dimensional code area and a decoding portion for reproducing information of the two-dimensional code based on the inspection lines, wherein the inspection line setting portion based on coordinate positions of 4 points within the two-dimensional code area decided by the two-dimensional code area deciding portion calculates coefficients for image position calculating equations for determining coordinate positions of center positions of respective cells in the two-dimensional code compensated for the inclination of the image by adding inclination information for the two-dimensional code.

9. A two-dimensional code reading device as defined in claim 8, wherein each of the image position calculating equations for determining the coordinate positions of the center positions of the respective cells in the two-dimensional code image is expressed by a recurrence formula with respect to a center position of each of the cells to reduce a volume of calculations for determining the coordinate positions of the center positions of respective cells compensated for image inclination by adding the inclination of the two-dimensional code by adding inclination information for the two-dimensional

code.

10. A two-dimensional code reading device as defined in claim 8 or 9, wherein coefficients in the image position calculating equations for calculating coordinate positions at four corners of the two-dimensional code area are divided by a predetermined same constant to make them integers and the coordinate positions of the cell center positions are determined by calculation with the integers only.

11. A two-dimensional code reading device as defined in claim 8 or 9, wherein a constant for dividing the coefficients symbolically determined for the image position calculating equations and selected from constants frequently and commonly used in the image position calculating equations is used to divide and convert the coefficients to smaller in size coefficients to make the two-dimensional code readable.

12. A digital camera incorporating a two-dimensional code reading device as defined in any one of claims 8 to 11.

13. A portable telephone with a digital camera, which incorporates a two-dimensional code reading device as defined in any one of claims 8 to 11.